

CLAIMS

1. A radially deployable flexible preform to form, after deploying, a tubular structure that is curable by polymerization after positioning it in a well or in a line and moulds to the shape thereof after curing, comprising in its constitution at least one resin comprising in its chemical formula at least one reactive multiple bond that is capable of subsequent reaction with compounds comprising in their constitution at least one terminal reactive multiple bond or a reactive multiple bond positioned at one end or the other of the molecular chain and/or on a pendant group.
2. A flexible preform according to claim 1, wherein the resin comprising at least one reactive multiple bond is selected from the group formed by unsaturated polyester resins and vinyl ester resins.
3. A flexible preform according to claim 1, wherein the resin is associated with at least one polymerisable oligomer and/or at least one monomer comprising at least one multiple bond in their chemical formulae.
4. A flexible preform according to claim 3, wherein the resin is associated with at least one oligomer and/or at least one monomer selected from the group formed by vinyl, acrylic, methacrylic, allyl or maleic compounds.
5. A flexible preform according to claim 1, wherein the resin comprising at least one reactive multiple bond is selected from the group formed by unsaturated polyester resins synthesized from at least one saturated or unsaturated polyol, and at least one saturated or unsaturated dibasic acid or anhydride, at least one of these compounds being an unsaturated compound.
6. A flexible preform according to claim 5, wherein the polyol used to synthesize the unsaturated polyesters is selected from the group formed by butylene glycols, neopentyl glycol, neopentyl glycols substituted by halogens, trimethylpentanediol, 1,4-cyclohexane-dimethanol, heavy diols obtained from bisphenol A, bisphenol F, bisphenol AF, said

bisphenols oxyalkylated, the formulae cited above comprising at least one halogen on the aromatic nucleus/nuclei, the above products wherein the aromatic nucleus/nuclei is/are at least partially hydrogenated, heavy novolac type alcohols, and cresol-novolac type cresols.

7. A preform according to claim 5, wherein the anhydride or acids used to synthesize the unsaturated polyesters is selected from the group formed by maleic anhydride, maleic acid, fumaric acid, itaconic acid, citraconic acid, cyclanic acids obtained, for example, from hexahydrophthalic anhydride, isophthalic and terephthalic acids, anhydrides such as tetrahydrophthalic anhydride, methylnadic anhydride, hexahydrophthalic anhydride, halogenated phthalic anhydrides such as tetrachlorophthalic anhydride, tetrabromophthalic anhydride or hexachloro-endomethylene tetrahydrophthalic anhydride.
8. A flexible preform according to claim 1, wherein the resin comprising at least one reactive multiple bond is selected from the group formed by vinylester resins synthesized from a compound comprising at least one diepoxy compound on at least one acrylic type unsaturated acid.
9. A flexible preform according to claim 8, wherein the acrylic type acid is selected from the group formed by acrylic acid and methacrylic acid and the diepoxy compound is selected from the group formed by bisphenol A, bisphenol F, bisphenol AF, novolac resins and cresol-novolac resins.
10. A flexible preform according to claim 1, containing at least two different resins.
11. A preform according to claim 3, wherein the polymerisable oligomer and/or monomer comprising at least one multiple bond in its formula is selected from the group formed by styrene, trimethylolpropane triacrylate, divinyl benzene, butyl acrylate, tert-butyl acrylate, 2-ethylhexyl acrylate, methyl acrylate, ethyl acrylate, hydroxypropyl acrylate, 2-hydroxyethyl acrylate, methyl methacrylate, ethyl methacrylate, monochlorostyrene, dichlorostyrene, monobromostyrene, dibromostyrene, vinyl toluene, vinyl acetate, diallyl ortho-phthalate,

diallyl isophthalate, triallyl cyanurate, triallyl carbonate, diallylglycol carbonate, bisphenol A, F or AF acrylate or dimethacrylate, dioxyalkylated or polyoxyalkylated bisphenol A, F or AF diacrylate or dimethacrylate in which the alkyl group(s) contains 2 to 24 carbon atoms

12. A flexible preform according to claim 1, containing at least one resin comprising in its chemical formula at least one multiple bond and is associated with at least one commercially available composition not forming part of the sub family of polymer vinyl esters that are normally either in the form of monomers, or in the form of oligomers or pre-polymers from the EBECRYL[®] series, the DIACRYL[®] series, the ATLAC[®] series, and the DERA-KANE[®] series.
13. A flexible preform according to claim 1, wherein the resin polymerization reactions are initiated as a function of the service temperatures employed for the flexible preform by selecting at least one suitable initiator selected from the group formed by the organic peroxides.
14. A flexible preform according to claim 1, wherein the resin polymerization reactions are initiated as a function of the service temperatures employed for the flexible preform by at least one initiator from the azoisobutyronitrile family, preferably selected from the group formed by 2,2'-azobis(isobutyronitrile) and 2,2'-azobis(2-methylbutyronitrile).
15. A flexible preform according to claim 1, wherein the resin polymerization reactions are initiated as a function of the service temperatures employed for the flexible preform by at least one initiator selected from the group formed by sulfur and potassium persulfate with molecular formula $K_2S_2O_8$.
16. A flexible preform according to claim 13, wherein the resin polymerization reactions are initiated as a function of the service temperatures employed for the flexible preform by at least one initiator associated with at least one accelerator such as a cobalt salt and/or a tertiary amine.

17. A flexible preform according to claim 13, wherein the resin polymerization reactions are initiated as a function of the service temperatures employed for the flexible preform by at least one initiator associated with at least one polymerization inhibitor such as a hydroquinone or tertibutyl catechol.
- 5 18. A flexible preform according to claim 1, containing at least one resin with a residual latent period, after storage at 22°C for a period of 20 days or more, of at least 3 hours at a temperature of about 10°C to about 90°C.
19. A flexible preform according to claims 1, containing at least one resin with a residual latent period, after storage at 4°C or less for a period of at least 60 days, of at least 8 hours at a temperature of about 40°C to about 80°C.
- 10 20. A flexible preform according to claim 1, wherein the resin comprising at least one reactive multiple bond in its formula that can subsequently react with compounds comprising in their constitution at least one terminal reactive multiple bond or a reactive multiple bond located at one end or the other of the molecular chain and/or in a pendant group is selected from the group formed by resins with a dynamic viscosity of less than about 2500 mPa.s at a temperature of about 20°C to about 70°C.
- 15 21. A preform according to claim 1, wherein the resin comprising at least one reactive multiple bond in its formula that can subsequently react with compounds comprising in their constitution at least one terminal reactive multiple bond or a reactive multiple bond located at one end or the other of the molecular chain and/or in a pendant group is selected from the group formed by resins that enable manual, mechanical or pressure or vacuum injection impregnation of fibrous supports constituting the reinforcement of said flexible preform, said support preferably being selected from the group formed by glass fibers, basalt fibers, carbon fibers, ceramic fibers, natural fibers, synthetic fibers, metal fibers and KEVLAR®.
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22. A preform according to claim 1, wherein the resin comprising at least one reactive multiple bond in its formula that can subsequently react with compounds comprising in their constitution at least one terminal reactive multiple bond or a reactive multiple bond located at one end or the other of the molecular chain and/or in a pendant group is selected from the group formed by non aggressive resins chemically or on inflating the internal and external elastic skins constituting the protection for the preform.
23. A preform according to claim 1, wherein the resin comprising at least one reactive multiple bond in its formula that can subsequently react with compounds comprising in their constitution at least one terminal reactive multiple bond or a reactive multiple bond located at one end or the other of the molecular chain and/or in a pendant group is selected from the group formed by resins with a polymerization temperature compatible with the heat resistance of the polymers and elastic skins and the components constituting the preform walls.
24. A flexible preform according to claim 23, wherein the resin polymerization temperature is 160°C or less.
25. A preform according to claim 1, wherein the resin comprising at least one reactive multiple bond in its formula that can subsequently react with compounds comprising in their constitution at least one terminal reactive multiple bond or a reactive multiple bond located at one end or the other of the molecular chain and/or in a pendant group is selected from the group formed by resins forming, after polymerization in combination with a fibrous support, a composite with a petroleum absorption of less than 3% by weight at a temperature of about 90°C.
26. A preform according to claim 1, wherein the resin comprising at least one reactive multiple bond in its formula that can subsequently react with compounds comprising in their constitution at least one terminal reactive multiple bond or a reactive multiple bond located

at one end or the other of the molecular chain and/or in a pendant group is selected from the group formed by resins forming a composite having a water absorption of less than 4% by weight at a temperature of about 90°C after polymerization in combination with a fibrous support.

- 5 27. A preform according to claim 1, wherein the resin comprising at least one reactive multiple bond in its formula that can subsequently react with compounds comprising in their constitution at least one terminal reactive multiple bond or a reactive multiple bond located at one end or the other of the molecular chain and/or in a pendant group is associated with at least one flow regulator.
- 10 28. A flexible support according to claim 27, wherein the flow regulator is selected from the group formed by polystyrenes, polyvinylacetates, polymethylmethacrylates and polycaprolactames.